January 20, 2016
Project No. 9101110001

Ms. Carolyn d'Almeida
U.S. EPA Region IX
75 Hawthorne Street
San Francisco, CA 94105

Subject: Response to U.S. Environmental Protection Agency (EPA) email on Transition Criteria, dated 10 November 2015
Former Fuel Storage Area (ST012)
Former Williams Air Force Base
Mesa, Arizona

Dear Carolyn,

Thank you for your email of 10 November 2015 with the attachment presenting EPA's assessment of whether the transition criteria have been met. As you know, the Air Force reviewed these assessments and presented additional data concerning the status of the transition criteria during the 23 November and 17 December 2015 BCT calls. The attached document presents some of the same information in a comment response format.

Please contact me at (602) 733-6040 or Catherine Jerrard at (315) 356-0810, ext. 204 or catherine.jerrard@us.af.mil, if you have any questions regarding the responses provided.

Sincerely,
Amec Foster Wheeler Environment & Infrastructure, Inc.

Donald R. Smallbeck

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I. Criteria for amount of steam to be injected:

Final RD/RAWP (May 2014): Table 4-2: SEE to EBR Transition Criteria

Steam injection (guideline)	319,357,000 lbs	Numerical thermal modeling of TTZs.	A targeted total of 319,357,000 lbs of steam is expected to be injected into the TTZ over the course of operations. This represents an average flushing of the TTZ pore volume of 1.6 pore volumes of steam as water throughout operation. Actual steam required to achieve the other criteria may be more or less than this estimate. Because this parameter does not directly measure remediation performance its primary use will be as a guideline to measure progress compared to the design.

Notes:

Table 5-2 SEE to EBR Transition Criteria Monitoring

Parameter	Target Criteria	Summary of Monitoring or Sampling and Analysis for Evaluation of Progress Toward Transition Criteria
Steam injection (guideline)	319,357,000 lbs	Steam production will be measured at the boilers.

Notes:

Weekly progress report 11/6/15

Total Steam Injected	248.4	million pounds (lbs)
Projected Total Steam Injection	320	million lbs
Steam Injected Vs Projected	78	%

Analysis: *Criteria for amount of steam injection has not been met. The design steam injection rate was based on 1.6 pore volumes of steam injection, which is lower than the commonly used criteria of 2 pore volumes of steam. The projected steam injection should be seen as a minimum amount of steam to be injected.*

Response*: The designed pore volume flushing estimate is a function of the contaminant to be removed and the degree of treatment required to do so. More pore volume flushes are required for less volatile contaminants and for greater degrees of removal. This thermal remediation project is different than many in that there is a follow on remediation step (EBR). In addition, the most prevalent COCs at the site (BTEX) are relatively volatile. For these reasons, a 1.6 pore volume flushing factor was selected as an appropriate design basis. The AF is in agreement that additional steam injection is necessary given other remediation progress measurements; however, the 320 million pound total is a guideline in the RD/RAWP and is not a minimum steam injection criteria.*

II. <u>Criteria for residual benzene concentrations:</u>

Final RD/RAWP (May 2014): Table 4-2: SEE to EBR Transition Criteria

Benzene concentrations:	100 to 500 µg/L	Concentration range where natural attenuation can complete degradation within the remedy time frame.	Benzene concentrations in extracted groundwater provide an indication of the amount of benzene remaining in the TTZ. These concentrations will be monitored against a target benzene concentration in the 100 to 500 µg/L range within the TTZ. This concentration range is predicted to achieve cleanup levels within the 20-year remedial timeframe based on modeling of groundwater contaminant attenuation outside the TTZs after active EBR (Appendix E). Benzene located around the perimeter of the TTZ and the perimeter/interior extraction wells will be evaluated for benzene concentrations to identify any perimeter influx that may mask benzene removal within the TTZ. It is expected that lower benzene concentrations within this range will be achieved in the interior of the TTZs than at the perimeter.

Table 5-2 SEE to EBR Transition Criteria Monitoring:

Benzene concentrations	100 to 500 µg/L	Benzene concentrations will be monitored in SEE wells during baseline sampling. Samples of extracted water (see Table 5-1) will be used to evaluate benzene concentrations during SEE operation. Sampling locations during operation will be determined in the field with a sampling strategy that starts at influent to the liquid treatment system and then moves progressively out to individual manifolds and, in some cases individual wells to trace the source of benzene contribution. The locations will also be selected to evaluate the relative contribution of contamination from outside vs. inside the TTZs.

Analysis: *EPA considers 100 µg/l of benzene in groundwater an appropriate target for a successful remediation, and would not support terminating steam treatment before the stated target (100 – 500 µg/l) is reached.*

Weekly progress report 11/6/15: LSZ

Progress Report
Steam Enhanced Extraction Remediation at the Former Williams AFB ST012 Site, Mesa, AZ
November 4, 2015

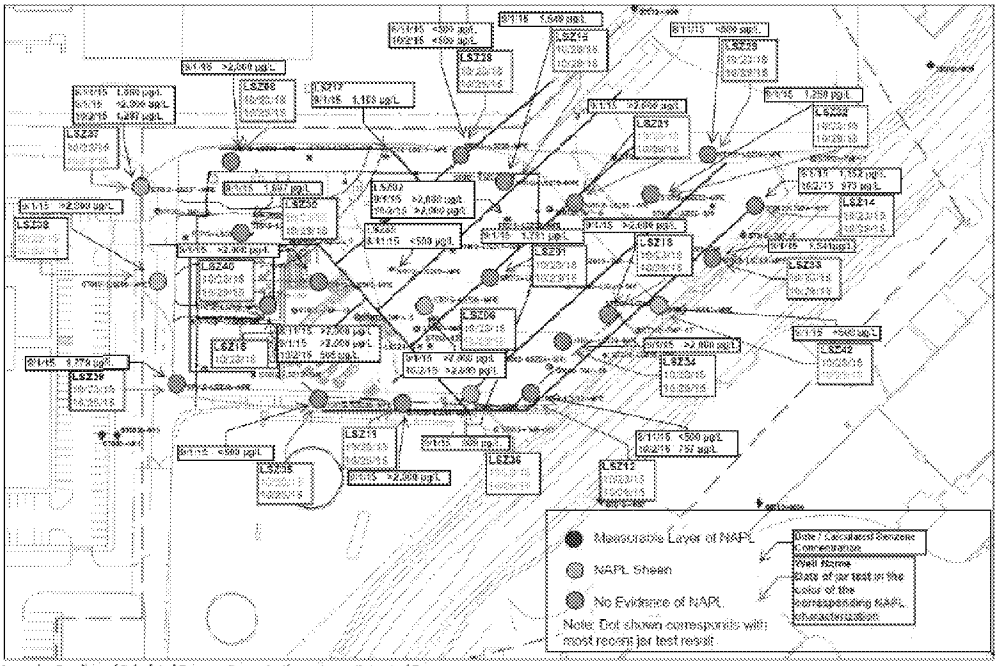

Figure 29. NAPL Screening Results and Calculated Benzene Concentrations – Lower Saturated Zone

Benzene Concentrations in LSZ Exceed 500 µg/L; Criteria has not been met for LSZ

Weekly progress report 11/6/15: UWBZ

Progress Report
Steam Enhanced Extraction Remediation at the Former Williams AFB ST012 Site, Mesa, AZ
November 4, 2015

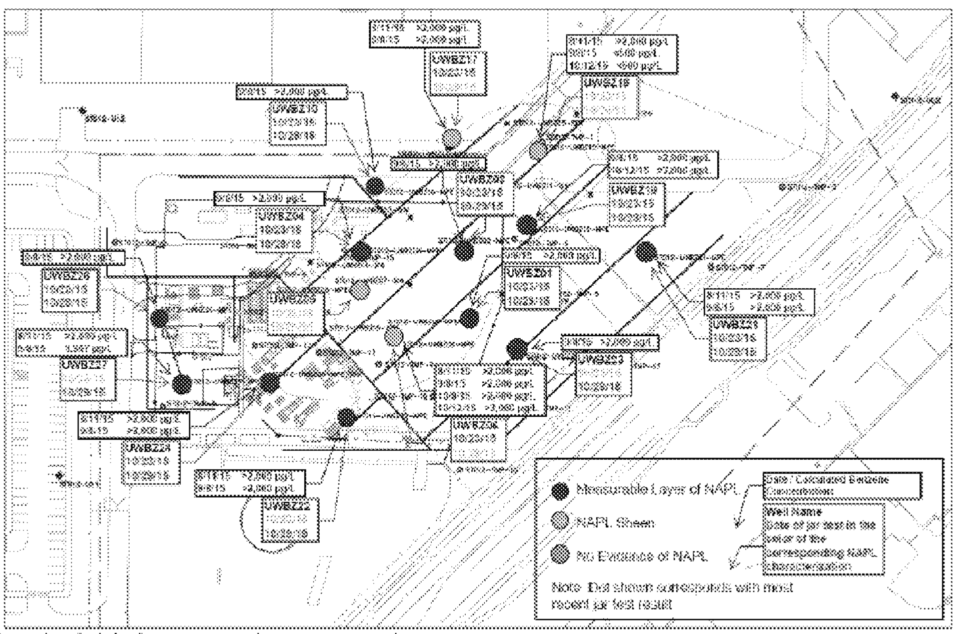

Figure 28. NAPL Screening Results and Calculated Benzene Concentrations – Upper Water Bearing Zone

Benzene Concentrations in UWBZ exceed 500 µg/L; significant NAPL present, Criteria has not been met for UWBZ

Weekly progress report 11/6/15: CZ

Progress Report
Steam Enhanced Extraction Remediation at the Former Williams AFB ST012 Site, Mesa, AZ
November 4, 2015

22. NAPL Screening Results and Calculated Benzene Concentrations

Figures 27-29 below present the screening level results for NAPL detected in samples collected from MPE wells across the site. Screening samples are typically collected on a weekly basis. The figures below also include calculated benzene concentrations of groundwater samples collected from MPE wells across the site.

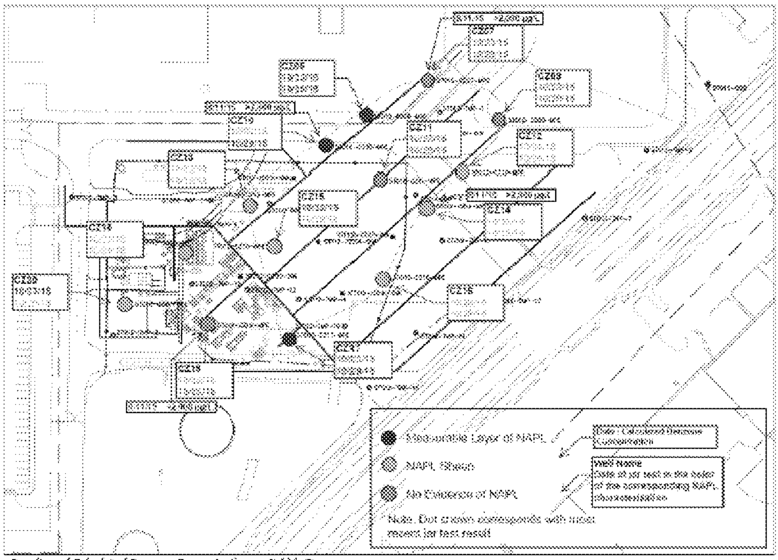

Figure 27. NAPL Screening Results and Calculated Benzene Concentrations – Cobble Zone

Benzene concentrations Exceed 5000020 µg/L in CZ, NAPL present; Criteria has not been met for CZ

***Response**: The established target in the RD/RAWP is 100 to 500 µg/L. As noted in Table 4-2 of the RD/RAWP, "This concentration range is predicted to achieve cleanup levels within the 20-year remedial timeframe based on modeling of groundwater contaminant attenuation outside the TTZs after active EBR." In addition, the text in Table 4-2 states that benzene contributed from the perimeter could mask the status of benzene removal within the TTZs. Remedial status within the TTZs, as well as benzene and LNAPL contributions from the perimeter, are being evaluated with jar testing and grab sampling from the extraction wells. This data is being reported in the Weekly Status Reports and BCT meetings. Due to the perimeter masking influence referred to in Table 4-2, it is likely that some areas within the TTZs will not achieve the 100-500 µg/L target. Although EBR will be implemented to focus on areas around and outside the perimeter of the TTZs, the EBR injection strategy will result in elevated terminal electron acceptor concentrations within the TTZs. This will enhance post SEE removal and allows for higher initial benzene concentrations than the 100 to 500 µg/L range within the TTZs while still meeting the overall 20-year timeframe. While the AF agrees that additional steam injection is necessary given consideration of all remediation progress measurements, the progress and evaluation of achieving the 100-500 µg/L target must be performed with consideration of the perimeter benzene contributions that will ultimately be addressed by EBR.*

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III. **Criteria for Mass Removal**

Final RD/RAWP (May 2014): Table 4-2: SEE to EBR Transition Criteria

Table 5-2 SEE to EBR Transition Criteria Monitoring:

Mass removal	Less than 10 percent of peak removal rate	Mass removal will be determined from a sum of individual mass removal rates such as: • Recovered LNAPL as measured by totalizing flow meter on the inlet to the LNAPL storage tanks • Mass in extracted vapors as measured at vapor collection manifold (vapor flow rate logged in PLC and influent vapor measured by FID/PID) • Mass in extracted water as measured in air stripper off gas and liquid laboratory samples (liquid discharge flow rate logged in the PLC, air stripper blower flow rate logged in the PLC, air stripper off gas measured by FID/PID, water treatment influent and GAC influent)

Final RD/RAWP (May 2014): Table 4-2: SEE to EBR Transition Criteria

Mass removal	Less than 10 percent of peak removal rate	10 percent selected as an indication of significant decline in mass removal by SEE. This target is consistent with removal rate trends observed at other sites and provides some accommodation for the uncertain mass present and the uncertain peak extraction rate. The actual site-specific removal rate curve will be evaluated to confirm or adjust the appropriateness of this value to represent a condition of diminishing returns.	The rate of contaminant mass removal from the subsurface will play a major factor in determining when SEE is complete or sufficient. The mass removal rate will be closely monitored and will be optimized by using pressure cycling events. Toward the end of the operational period, the mass removal rates will be modest when compared to the peak removal rates (typically less than 10 percent of the rate observed at peak operations). Contaminant mass located around the perimeter of the TTZ may contribute a continuing source of mass for removal by the SEE system, which could mask the progress of mass removal within the TTZs, so the contribution of perimeter/interior extraction wells may be evaluated for mass removal towards the end of operations to identify any perimeter influx. Continued operation below the 10 percent of peak removal rate may be implemented depending on the significance of continued mass removal, the status of COC concentrations (e.g., benzene) in extracted fluids, and the need/ability for EBR to achieve further degradation based on data collected during the EBR field test.

11/6/15 Weekly Progress Report

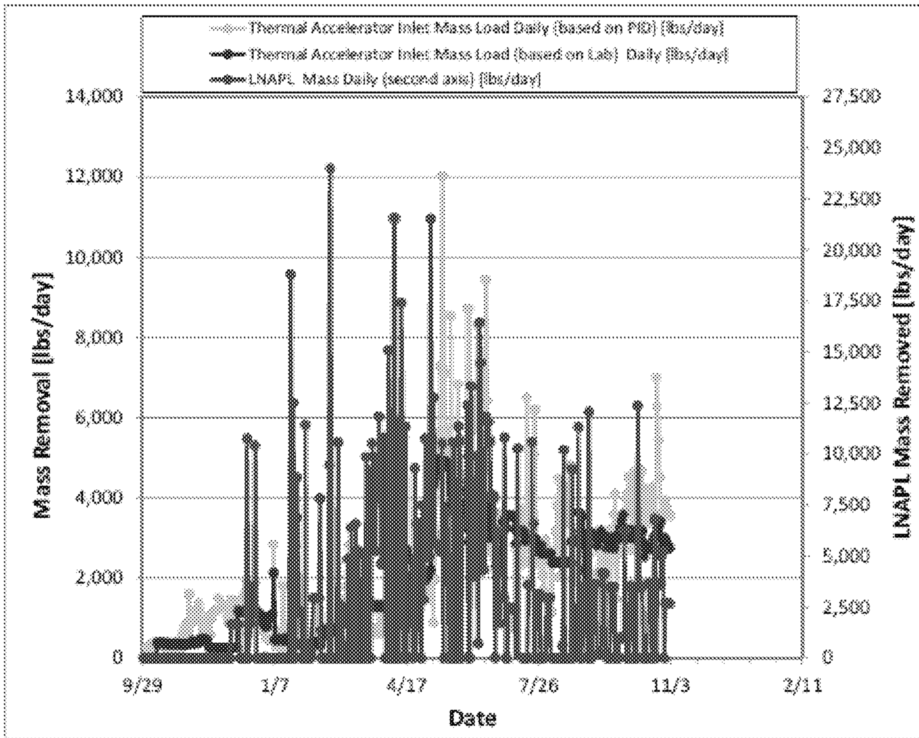

Figure 4. Daily Mass Removed

Analysis: *Current LNAPL recovery is at 30% of peak removal rate; vapor recovery is 50% of peak removal rate; Criteria for termination of steam injection has not been met. EPA considers the criteria of 10% of the peak mass recovery to be high compared to the mass recovery rates that have been used to support thermal treatment termination at other sites. We cannot support termination of treatment when thousands of pounds of contaminant mass are being extracted daily.*

Response*: Mass recovery rates used to support thermal treatment termination at other sites may not be directly comparable depending on the circumstances of those sites. Specifically, this site includes known NAPL mass outside of the TTZ and an active EBR phase planned for post-SEE. This additional remedial step may not be consistent with designs at other sites. A target of 10% of peak mass removal is appropriate for ST012 because of the follow-on EBR planned.*

As presented in the 23 November and 17 December BCT calls, peak mass removal occurred on 14 May at 22,506 pounds per day. Total mass removal (the RD/RAWP criterion) has dropped significantly since the peak. Currently the total mass removal rate is ~20 to 40% of the peak with an LNAPL removal increase following the recent coordinated depressurization in all three zones. Mass recovery rates have fluctuated and were as low as about 12% in mid December (updated graphs below):

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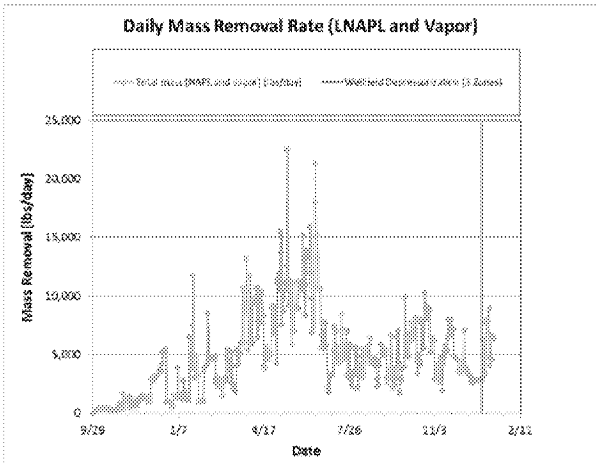
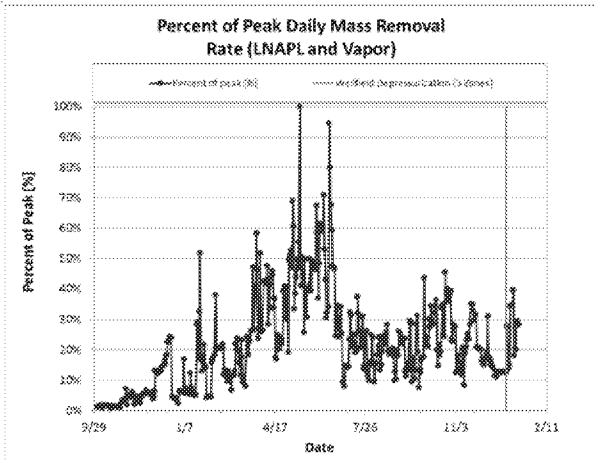
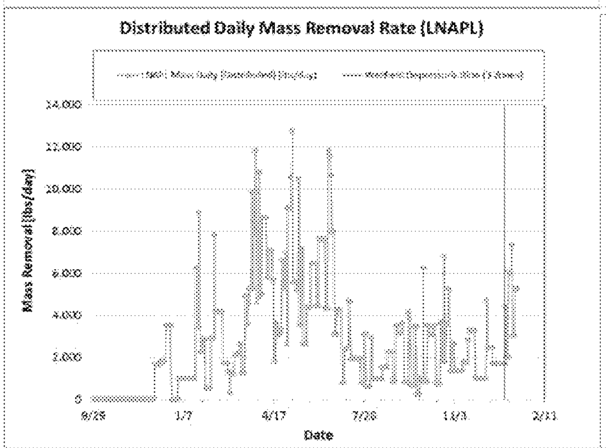
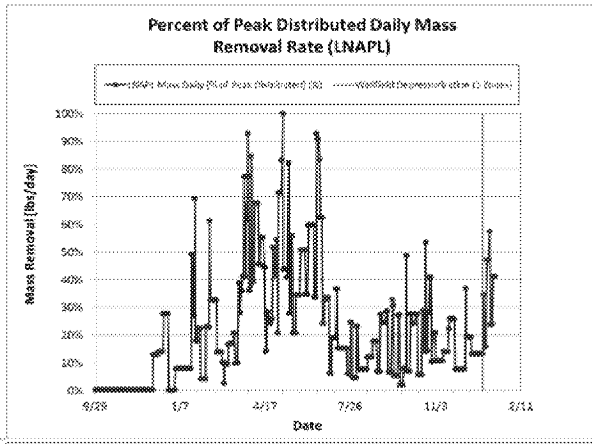
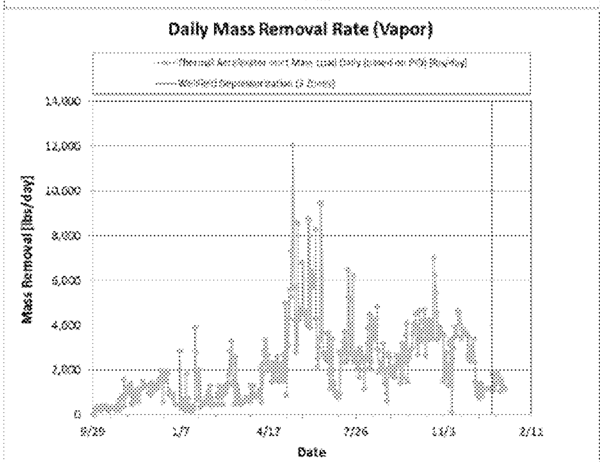
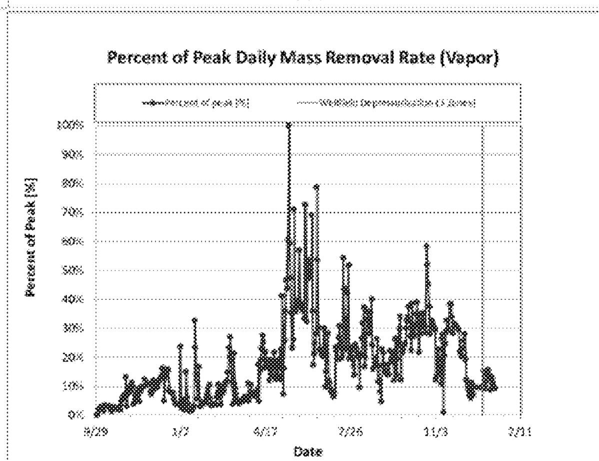

Daily Mass Removal Rate (LNAPL and Vapor)
Mass Removal (lbs/day)
25,000
20,000
15,000
10,000
5,000
0
9/29
1/7
4/17
7/26
11/3
2/11
Date


Percent of Peak Daily Mass Removal Rate (LNAPL and Vapor)
Percent of Peak (%)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
9/29
1/7
4/17
7/26
11/3
2/11
Date


Distributed Daily Mass Removal Rate (LNAPL)
Mass Removal (lbs/day)
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
9/29
1/7
4/17
7/26
11/3
2/11
Date


Percent of Peak Distributed Daily Mass Removal Rate (LNAPL)
Mass Removal (lbs/day)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
9/29
1/7
4/17
7/26
11/3
2/11
Date


Daily Mass Removal Rate (Vapor)
Mass Removal (lbs/day)
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
9/29
1/7
4/17
7/26
11/3
2/11
Date


Percent of Peak Daily Mass Removal Rate (Vapor)
Percent of Peak (%)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
9/29
1/7
4/17
7/26
11/3
2/11
Date

IV. Criteria for completion of pressure cycling:

Final RD/RAWP (May 2014): Table 4-2: SEE to EBR Transition Criteria

Completion of Pressure Cycling	Completion of multiple pressure cycles in each area	Pressure cycling has been demonstrated at other sites to improve mass removal beyond that achieved by uniform heating only.	Once the TTZ temperatures have stabilized, further mass removal improvement can be achieved by releasing steam pressure to cause volatile LNAPL constituents to rapidly vaporize for subsequent collection by MPE wells. The process of building and releasing the pressure is repeated until no additional significant increases in effluent vapor phase concentrations occur when steam pressure is reduced.

Table 5-2 SEE to EBR Transition Criteria Monitoring:

Completion of Pressure Cycling	Completion of multiple pressure cycles in each area	Because the pressure cycling process results in the volatilization of contaminants upon release of the pressure, extracted vapors will be the primary source for measurement of pressure cycling effectiveness. Vapors will be primarily monitored with hand held devices with the objective to demonstrate diminishing returns from pressure cycles.

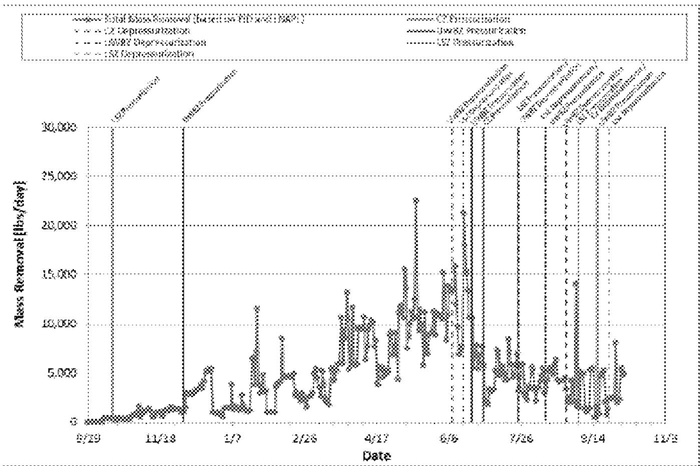
Analysis: *This criterion is nonspecific. The purpose of pressure cycling, and indicated in the statements above is to enhance volatilization of contaminants. It is not intended to improve mobilization and recovery of NAPL which may have been retarded by premature initiation of pressure cycling. Ideally, the bulk of NAPL should be removed first before initiation of pressure cycling as the finishing step. As long as NAPL is being recovered, steam injection should continue, then institute pressure cycling to remove the last of the volatiles. It is unfortunate that we did not discuss criteria for initiation of pressure cycling in the work plan.*

Response*: As indicated in the criteria description, the pressure cycling can be initiated once TTZ temperatures have stabilized to enhance removal of volatile LNAPL constituents (i.e., benzene). This was the basis for the decision to initiate pressure cycling with less focus on maximizing LNAPL removal. In addition, the expected perimeter contribution of LNAPL limits the validity of elimination of LNAPL removal as a criterion for initiating pressure cycling. The design of SEE and the decision to initiate pressure cycling was based on the achievement of temperatures and breakthrough of steam to extraction wells. MPE well vapor monitoring temperatures, TMP data, estimated formation water temperatures were all considered. Initiation of pressure cycling was reviewed on a BCT call on 27 May 2015 prior to initiation and again at the 24 June 2015 BCT meeting prior to expansion beyond the northern portion of the UWBZ. It has been discussed at each BCT call/meeting since.*

October BCT Presentation Slide 30

Pressure Cycling and Mass Removal

Mass Removal over Time



- **Peak mass removal occurred April – June 2015 (vapor and NAPL phases)**

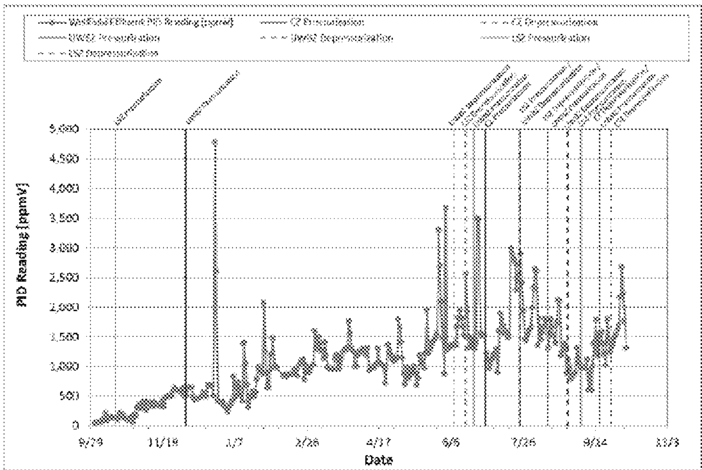
NAPL Recovery was increasing up until the time pressure cycling was imitated. Did decline in recovery rate occur because pressure cycling was initiated early? Consider the analogy of liquid recovery with pressure cycling similar to turning spigot of garden hose on and off….

Response: *The peak NAPL removal occurred in early to mid-May. This coincided with the establishment of steam breakthrough at several wells. In the last two weeks of May and first week of June, NAPL removal was reduced from the peak. Depressurization cycles were initiated in the UWBZ and LSZ in early- and mid-June and the NAPL removal increased again immediately following the LSZ depressurization. These data would indicate the NAPL removal had started to decrease from peak and that the initiation of the pressure cycling increased NAPL recovery. Please note that the pressure cycling did include continued steam injection and flushing between injection and extraction wells, just at a lower rate than before. Initiating depressurization was also done to minimize the migration of steam outside of the TTZ. Complete pressure cycling by shutting off the steam injection fully was not initiated in the CZ, UWBZ and LSZ until 11 November 2015, 14 October 2015, and 25 September 2015 respectively.*

October BCT Presentation Slide 31

Pressure Cycling and Vapor Mass Removal

Wellfield Vapor Influent PID Concentrations over Time



- Vapor phase removal has increased after initiation of pressure cycling

The criteria in the RD/RAWP stating that "the process is repeated . . .until no additional significant increases in effluent vapor phase concentrations occur when steam pressure is reduced" has not been met.

***Response**: Pressure cycling is continuing. The effect on vapor concentration during a depressurization cycle in a single zone is at least partially masked by pressurization in other zones. Baseline vapor VOC contributions from outside the TTZ may also be masking the effects of pressure cycling. The team is coordinated pressurization/depressurization over all three zones to better evaluate the influence of pressure cycling on vapor concentrations. The first coordinated depressurization event begun on 28 December 2015 did not show a significant increase in vapor concentrations.*

V. <u>Criteria for Boiling Temperatures</u>

Final RD/RAWP (May 2014): Table 4-2: SEE to EBR Transition Criteria:

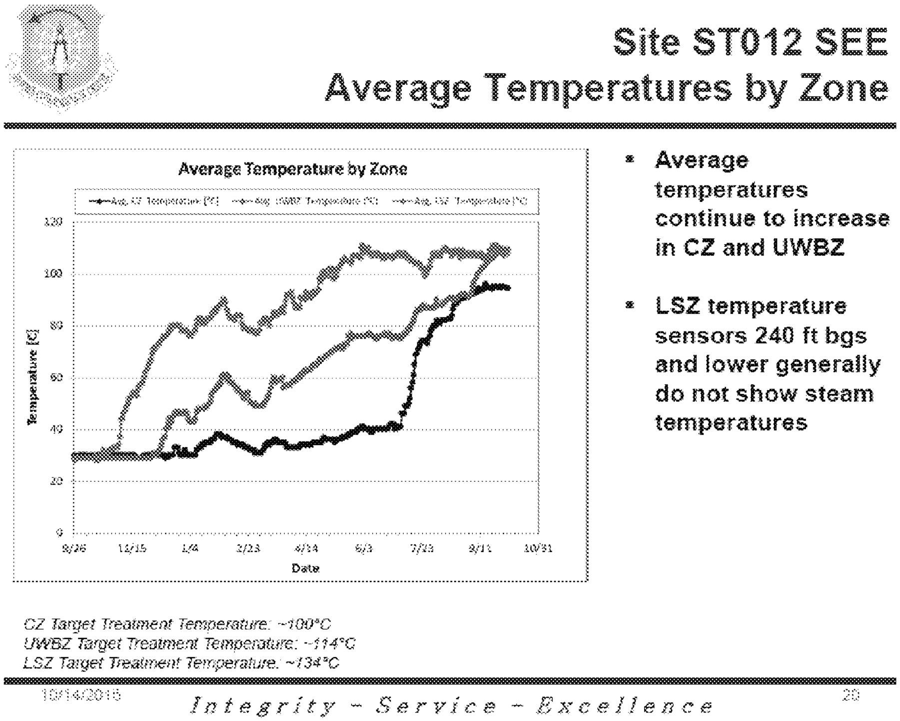
Table 4-2 SEE to EBR Transition Criteria

Parameter	Target Criteria	Basis for Target Criteria	Description
Subsurface Temperature	Varies by Depth (higher boiling temperatures with depth – see Figure 5.3, in Appendix D of the RD/RAWP	Numerical thermal modeling of TTZs supported by depth-specific boiling points.	Efforts will be made during operations to inject steam throughout the TTZ to target achievement of boiling point temperatures for groundwater throughout the TTZ. A steam zone will be generated and maintained where possible with the goal of pushing steam across the TTZ to form a steam zone between injection and extraction wells, with breakthrough of steam demonstrated at extraction wells. It is anticipated that a steam zone will not be able to be created and maintained in the LPZ. Other areas of low permeability may also be discovered during operation that limit achievement of target temperatures. Operational adjustments will be made where possible to increase temperatures in such zones that are slower to reach target temperatures. The energy balance will be used to support evaluation of achieving the temperature goal. Shut-down of steam will only be considered after achieving boiling point temperatures throughout the TTZ with the exception of the LPZ and other potential areas of low permeability and provided that operational adjustments are made to attempt to achieve the temperature goal in areas that are resistant.

Table 5-2 SEE to EBR Transition Criteria Monitoring:

Subsurface Temperature	Varies by Depth (higher boiling temperatures with depth – see Figure 5.3, in Appendix D of the RD/RAWP)	17 individual TMPs will be equipped with 15-24 vertical temperature measurement locations per TMP. In addition, each SIW and MPE well will be equipped with the infrastructure for a co-located TMP to be installed for temperature measurements to be collected. Co-located TMPs will be permanently installed for the 18 deep SIWs in the LSZ and will monitor the temperature at the top, middle and bottom of these wells. Two mobile temperature arrays in the CZ and two mobile temperature arrays in the UWBZ will be used to monitor temperatures in the remaining MPEs and SIWs (top, middle and bottom depths). Temperature monitoring of the SIW/MPE wells, along with extracted fluid and vapor temperatures, will supplement the 17 individual TMPs to monitor temperature distribution at the site.

October BCT Presentation Slide 31



11/6/15 Weekly Progress Report

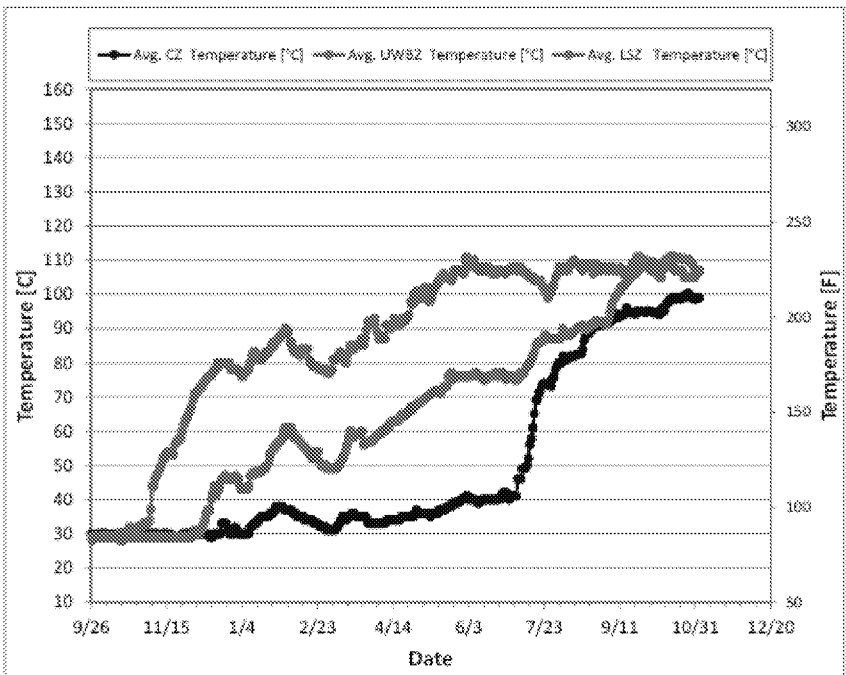


Figure 6. Average Soil Temperatures

Analysis: According to slide 20 from Oct 15, the target temperature for the CZ is ~ 100C, which has almost been met. The target for the UWBZ is ~114C, which has almost been met. The target for the LSZ is ~134C, which has not been met.

***Response**: The slide from the October 2015 BCT call includes averages of all operating and reliable thermocouples within each TTZ at that time. As noted previously in the September BCT call, the average in the LSZ includes thermocouples to a depth of approximately 245 ft bgs (approximately the same depth as the bottom of the steam injection screens). Due to buoyancy effects, injected steam is not able to heat the lower portions of the injection interval and steam temperatures have not been observed at 240 ft bgs and below in the TTZ, except at a few monitoring locations. Limited heating of the bottom of the TTZ was anticipated during the design and is acceptable because the historical low groundwater table at the site of approximately 232 ft bgs limited the NAPL contamination to be primarily above 235 ft bgs. When only the thermocouples in the LSZ above 235 ft bgs are considered, the average LSZ temperature is approximately 10°C higher and as of the end of December just prior to the latest depressurization was approximately 122°C.*

In addition to the effects of the lower thermocouples on the average TTZ temperatures, the failure of several Temperature Monitoring Points (TMPs) plays a role in lowering the average calculated temperature in each zone. TMPs have failed when liquids (groundwater, NAPL, and condensed steam) have penetrated both the grout seal around the TMP casing and the threaded joints of the TMP casing. Once a TMP has failed, it is removed from the average temperature calculations and is only included again if successful repairs are implemented. In general, there is a correlation between the progression of heating and timing of the TMP failures, indicating that the arrival of the steam front at the TMP usually coincides with the failure of the TMP. As such, failed TMPs were typically at steam temperatures at the time of failure and their removal from the average temperature calculations tends to lower the overall calculated average. As a result, calculated average temperatures are biased low. To evaluate the average temperature including the failed TMPs, average temperatures by zone using the maximum temperature achieved at each temperature sensor location throughout the project were calculated. This average includes maximum temperatures recorded at the failed TMPs before their failure. These averages are shown in the table below and demonstrate that target treatment temperatures have been achieved in all zones. In addition, steam breakthrough has been achieved at all interior MPE wells where it was expected (see summary table).

	Temperature Monitoring Point Maximum Depth-Averaged Temperature[1] (°C) During SEE Operations by Zone				
Temperature Monitoring Point	**CZ**	**UWBZ**	**LPZ**	**LSZ**	**LSZ (depths above 235 ft bgs)**
TMP01	114.6	130.5	N/A	N/A	N/A
TMP03	N/A	N/A	137.5	114.2	120.7
TMP04	N/A	N/A	103.8	118.8	127.1
TMP05	110.3	N/A	N/A	N/A	N/A
TMP06	N/A	N/A	137.4	135.0	135.9
TMP07	N/A	N/A	134.6	137.2	140.2
TMP08	N/A	N/A	136.6	131.3	135.4
TMP09	N/A	N/A	132.5	134.1	139.3
TMP11	N/A	N/A	107.7	119.1	131.7
TMP12	75.7	90.3	121.8	121.4	131.3
TMP13	102.1	119.8	130.6	137.3	138.5
TMP14	N/A	N/A	133.6	124.3	136.3
TMP15	113.1	123.3	128.7	126.5	135.6
TMP16	N/A	N/A	126.7	120.4	131.0
TMP17	N/A	N/A	135.2	136.9	136.9
Maximum depth-averaged by zone[2]	**103.1**	**116.0**	**128.2**	**127.4**	**133.8**

If N/A, Temperature Monitoring Point has no sensors in that zone
[1] Temperature of the thermocouples across each depth zone are averaged for each TMP and each available time interval and then the maximum value of those averages throughout operations is listed in the table.
[2] Average of maximum depth-averages listed above for all TMPs in each zone.

Summary of Steam Breakthrough to MPE Wells

Well	Well Location	Required to Reach Steam Temperature	Steam Breakthrough Achieved at MPE Temperature Calculated	Well	Well Location	Required to Reach Steam Temperature	Steam Breakthrough Achieved at MPE Temperature Calculated	Well	Well Location	Required to Reach Steam Temperature	Steam Breakthrough Achieved at MPE Temperature Calculated
CZ07	Perimeter	No	No	UWBZ01	Interior	Yes	Yes	LSZ01	Interior	Yes	Yes
CZ08	Perimeter	No	No	UWBZ02	Interior	Yes	Yes	LSZ02	Interior	Yes	Yes
CZ09	Perimeter	No	No	UWBZ04	Interior	Yes	Yes	LZS04	Interior	Yes	Yes
CZ10	Perimeter	No	Yes	UWBZ05	Interior	Yes	Yes	LSZ05	Interior	Yes	Yes
CZ11	Interior	Yes	Yes	UWBZ06	Interior	Yes	Yes	LSZ06	Interior	Yes	Yes
CZ12	Perimeter	No	Yes	UWBZ10	Perimeter	No	Yes	LSZ08	Perimeter	No	Yes
CZ13	Perimeter	No	Yes	UWBZ17	Perimeter	No	Yes	LSZ11	Perimeter	No	Yes
CZ14	Perimeter	No	Yes	UWBZ18	Interior	Yes	Yes	LSZ12	Perimeter	No	No
CZ15	Interior	Yes	Yes	UWBZ19	Perimeter	No	Yes	LSZ13	Interior	Yes	Yes
CZ16	Perimeter	No	Yes	UWBZ20	Dual Phase - Perimeter	No	No	LSZ14	Perimeter	No	No
CZ17	Perimeter	No	Yes	UWBZ21	Outside UWBZ	No	No	LSZ15	Interior	Yes	Yes
CZ18	Perimeter	No	No	UWBZ22	Perimeter	No	No	LSZ16	Interior	Yes	Yes
CZ19	Perimeter	No	No	UWBZ23	Outside UWBZ	No	Yes	LSZ17	Perimeter	No	Yes
CZ20	Outside CZ	No	No	UWBZ24	Dual Phase - Perimeter	No	No	LSZ28	Perimeter	No	Yes
				UWBZ26	Outside UWBZ	No	No	LSZ29	Perimeter	No	No
				UWBZ27	Outside UWBZ	No	Yes	LSZ30	Interior	Yes	Yes
								LSZ31	Interior	Yes	Yes
								LSZ32	Interior	Yes	Yes
								LSZ33	Perimeter	No	Yes
								LSZ34	Interior	Yes	Yes
								LSZ35	Perimeter	No	Yes
								LSZ36	Perimeter	No	Yes
								LSZ37	Perimeter	No	Yes
								LSZ38	Perimeter	No	Yes
								LSZ39	Perimeter	No	No
								LSZ40	Interior	Yes	Yes
								LSZ42	Perimeter	No	Yes